Killer Hardware Tips

Too Cool To Follow Rules

IF YOU'RE A USER WHO CAN'T LEAVE THINGS ALONE IF THERE'S A CHANCE YOU CAN MAKE THEM BETTER, EVEN IF IT MEANS BUCKING THE NORM, READ ON. WE HAVE SOME TIPS and tricks that just might make you more productive.

Modify Your BIOS Boot Logos

You've customized your PC's case and tweaked the OS to your exact specifications. If you think you have personalized everything you can possibly personalize, we ask you: Have you created a custom boot logo yet?

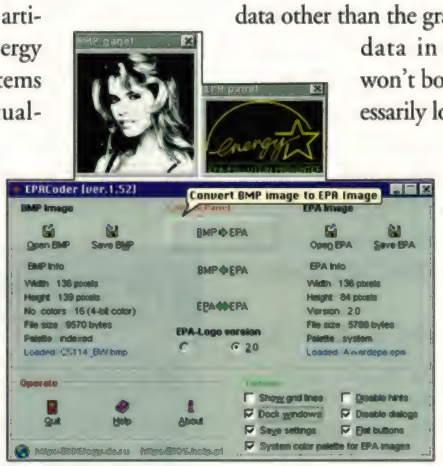
As your PC boots, it probably displays one or two graphics: the Energy Star logo and possibly the manufacturer's logo. These display during the POST (power on self test), which occurs before the PC passes control to the OS. Changing these logos means inserting new graphics into the PC's BIOS. An assortment of software can help do the job.

On PCs with a Phoenix or Award BIOS, the Energy Star logo is stored in a little-used file format called EPA. BMPtoEPA (www.flazh.de) and EPAcoder (bios.help.pl/tools/epacoder.html #English) are utilities that can convert BMP graphics to the EPA format. You can create your own Energy Star logo or download one. A library of replacement graphics is available at juggernaut.de /seiten/pcfun/bios/epadownload.htm.

Once a graphic is in the correct format, you need to flash it into the BIOS. CBROM Repository (www.stormpages .com/crazyape/cbrom.html) and AwardMod (sourceforge.net/projects/awardmod) are BIOS flashing utilities for systems with Award BIOSes. You'll also need a BIOS image file, which is a copy of the BIOS for your particular motherboard.

Systems with an AMI BIOS don't use the EPA file format; they use the more common PCX format for a 132-pixel square logo. Use a program called AMIBCP (www.virtual-hideout.net/guides /bios_logo_mods_part2/amibcp.zip) to insert that graphic into your BIOS image file and a utility called FLASH (bios.help.pl /tools/amiflash.html) to flash the modified BIOS image to the motherboard. "Virtual Hideout" is a detailed article on hacking the Energy Star logo on AMI systems available at www.virtual-hideout.net/guides /bios_logo_mods _part2/index.shtml.

"Some Award motherboards do have adverse reactions to certain types of EPA files, mainly the EPA 2.0 format, which many still do not support. This can cause garbage on the screen during boot up but typically doesn't keep the system from running," says Ben Brown, author of the "Virtual Hideout" article. "On the other hand, I've experienced some problems with AMI BIOSes not booting after a nonstandard PCX file was added."



EPACoder will convert your BMP image to the EPA format, enforcing the strict size limitations on images replacing the Energy Star logo.

If your flashing program doesn't explicitly support your motherboard and BIOS, don't try to make it work—it could spell disaster. Flashing your PC's BIOS is equivalent to a brain transplant, so take care. Gary Simpson, director of Technology and Strategic Initiatives at Phoenix Technologies, warns against using third-party utilities that modify your BIOS.

"Reprogramming your BIOS just for grins is not recommended," he says. "I would definitely recommend that anyone who is going to do this create a disaster recovery floppy first. The danger here is these utilities are poking around in a binary image and making decisions about what they think they find there. If these programs are looking for an image that they believe is the Energy Star logo and replacing that with something, there is always the chance that they could do something harmful," Simpson says. If the utility overwrites data other than the graphics or moves other data in the BIOS, the PC won't boot. All hope isn't necessarily lost, however.

"Most machines have a section of the BIOS that is unerasable called the boot block. When you start the machine, the first code that executes is in that boot block section of the flash ROM. It checks the rest of the image in the erasable part of the BIOS to make sure that it appears to be a healthy BIOS. If it fails to checksum, it has just enough capability within that boot block to set up the chipset, find the floppy controller, and search for a recovery diskette," says Simpson. The recovery disk is a specially

formatted floppy that includes an image of the BIOS and a utility for copying it back to the flash ROM. If you don't have a recovery disk, the OEM may send you one. "If not, you have a boat anchor."

To reprogram the BIOS, a utility has to turn on the programming voltage to the ROM. A single algorithm to reprogram a flash ROM doesn't work across all motherboards; it depends on the chipset and on individual motherboard design, says Simpson.

Is tweaking the boot logo any more dangerous than flashing a new version of your BIOS? If the software you use to replace the graphic does the job correctly, the risk is the same. That is, it's reasonably safe if the power doesn't go out in the middle of the process.

In addition to the Energy Star logo, many BIOSes support a low-res 640 x 480 OEM logo that may appear at boot time.

"In most motherboards, the OEM logo is easily changed using special software that comes with the motherboard on its CD-ROM," says Gabriel Torres, editor of hardwaresecrets.com. If you don't have the CD, check the motherboard manufacturer's Web site. For example, FIC (www.fica.com) motherboards include software called LogoGenie to customize the boot logo. Amptron offers a BIOS logo editor at www.amptron.com/html/utility.html.

"As far as Award goes, you can add a full-screen logo as a 640 x 480, 16-color BMP file by using the CBROM/LOGO command, though this only works on BIOSes that have full-screen logo capability," says Brown.

The OEM logo is easier to change than the Energy Star logo because it's meant to be changed not by the user but by the company that builds and sells computers. Like the Energy Star graphic, the OEM logo usually lives in the flash ROM and has strict size limitations.

"The manufacturer software automatically converts the file format and checks the size for you," Torres says.

We Destroy CDs So You Don't Have To

Each time you open a case of CD-R or CD-RW discs, you see it: manufacturer precautions. Don't scratch the disc, no solvents or ballpoint pens, avoid high temperatures, and keep your grubby fingerprints off the media. To most people these things are common sense. To us they are a challenge.

We took six brands of CD-R and CD-RW discs and tortured them to find out just what you really can and can't do to optical media. We used CD-Rs from Memorex, Maxell, and IBM, plus the cheapest CD-R we could find: 4X Imation discs free after a rebate. For CD-RWs, we used generic discs from Sony and Staples.

These CDs died horrible deaths for the sake of science. Our advice: Coddle CD-Rs as you would a newborn baby.

We started our destruction by simply writing the word "DATA" on each disc's label with a ballpoint pen in quarter-inch high letters. Then we tried to copy all the data from the discs. The results were universally poor. For instance, the Memorex and Maxell CD-Rs gave us some of the data back but choked on many files. The IBM disc refused to mount at all. Data on a CD-R disc lives just under the top label, so any scratch to the label gouges directly into the data surface.

The discs we tested were more tolerant of scratches on the bottom (nonlabel) side. We raked the business end of a paper clip across six discs and were easily able to recover all the data. The discs didn't fare so well after a six-inch slide down a concrete sidewalk. The bottoms were so badly scratched that none of them would mount.

Next, we turned up the heat by leaving six fresh discs on the dashboard of a car in the Arizona desert all day. The temperature outside the car hit 103 degrees. Inside, it was scorching. At the end of the day, the plastic CD cases were completely warped, but the discs remained flat. Most of the discs worked fine afterwards. The Memorex disc would mount, but we couldn't retrieve any files from it. The Sony CD-RW wouldn't mount in one drive but did work in another.

The moral of the story: CD-R discs are indeed fragile. The warnings are serious. No brand seemed more resilient than the others. If a terrible fate befalls your precious CD, it pays to try extracting the data using multiple drives. We found that when one CD-ROM drive was unable to access any data, another drive was often able to dig out some of the data. CPU

by Kevin Savetz

Infinite Loop

Blame It On George

The release of "Star Wars: Attack of the Clones" had chat rooms and message boards buzzing with anticipation. It also caused a tremendous amount of worker absenteeism on May 16, 2002, the first day the film was released. Just before the film's release, the outplacement firm Challenger, Gray & Christmas estimated that as many as 2.6 million full-time or salaried employees (accounting for 46% of the film's first-day viewers) would miss work on May 16 due to the "Padme Pox," also known as "Skywalking Pneumonia," "Hem-droids," and "Pink Jed-eye."

Challenger, Gray & Christmas estimates the widespread skip day resulted in approximately $319 million in lost revenue for U.S. businesses. Major metropolitan areas, such as New York City, Chicago, Los Angeles, and San Francisco, were probably the hardest hit. The firm arrived at its estimates based on statistics from the premiere of "Star Wars: The Phantom Menace" and the Bureau of Labor Statistics.